

REMARKS

STATUS OF THE CLAIMS

Claims 1-20 were examined. The indication of allowable subject matter in claims 3-8, 9-18 and 20 is noted, with appreciation. Claims 1, 2 and 19 stand rejected over prior art.

This Amendment cancels claim 20; adds new claim 21; and amends claims 1-3, 6, 9, 10, and 19. Claims 1-19 and 21 are therefore presented for reconsideration. Claims 1, 9, 18 and 19 are independent.

THE AMENDMENTS

Independent claims 1 and 19 are amended as to form by relocating the phrase “depending on engine operating conditions;” and by adding that movement of the movable operating member is “created by motion-converting a rotation movement produced by” an electromagnetic force. This addition is supported by at least claim 18, which remains in its original form. A conforming amendment has been made to dependent claim 3. The amendments to dependent claim 2 clarify how the rotational movement produced by the electromagnetic force results in rotational movement of the camshaft. The amendment to dependent claim 6 clarifies the location of the recited link.

Independent claim 9 is amended as to form by rearranging several recitations, and by substituting “device” for “mechanism” in regard to the “installation-angle adjusting” limitation. (Similar amendments were made to claim 1 in the Amendment previously filed, on September 11, 2006.) Further, certain unduly restrictive limitations have been deleted from claim 9, and now appear in new dependent claim 21. Conforming amendments have been made to dependent claim 10.

No new matter is introduced by these amendments.

THE REJECTION

Claims 1, 2 and 19 are said to be anticipated by Suga (US 5,203,291), under 35 U.S.C. §102(b). The rejection is respectfully traversed for at least the following reasons.

The invention is directed to an engine valve timing control device capable of variably controlling a relative-rotation phase (a phase-angle difference) between a driving rotational

member (driven by the engine crankshaft) and a driven rotational member (associated with a camshaft) *directly by way of an electromagnetic force*. Referring, for example, to Figs. 1-5, this is accomplished by an installation angle adjusting mechanism 4 that includes a movable operating member 11, which is provided between the driving rotational member (driving plate 2 with sprocket 3) and the driven rotational member (spacer 8 on camshaft 1). As such, movable operating member 11 is engaged and guided (see spiral guide groove 28, guide walls 9a, 9b, link arm 14 and lever 12) in such a manner as to be circumferentially rotatable as well as movable substantially radially with respect to the camshaft. This advantageously results in a wide working-angle range for the phase angle of the installation-angle adjusting mechanism. Importantly, movement of the movable operating member (11) is effected by *converting a rotational movement (a torque) produced by an electromagnetic force* (e.g., electromagnetic brakes 26, 27). This last-mentioned feature is specifically recited in each independent claim.

In contrast, each of Suga's three embodiments relies on *hydraulic pressure* to control the phase-angle difference between driving and driven rotational members. The Office Action appears to rely on the second embodiment (Figs. 5-8), in which phase-angle control is accomplished by means of a two-position spool valve that switches hydraulic pressure between oil passages. Specifically, spool valve 180 permits the application of hydraulic pressure from a source (oil pump) 147 to either of two plungers 136, 138 *by controlling the flow of hydraulic fluid* through discharge passages 174, 176 leading away from the plungers (see col. 8, lines 31-51). Referring to Fig. 7, plungers 136, 138, which are carried by rotary member 114, respectively engage wedge-shaped projections 110, 112, which are carried by driven sprocket 104. Relative rotation of rotary member 114 and driven sprocket 104 occurs when, in response to engine operating conditions, spool valve 180 changes position so as to *alter the relative hydraulic pressures* applied to the plungers 136, 138. This is described in detail at col. 9, line 6 through col. 10, line 20 of Suga.

Spool valve 180 is moved *linearly* between positions by an electromagnetic actuator 182, which "is controlled on the basis of an ON-OFF signal from a controller ... that detects the current engine running condition" Suga, col. 8, line 67 through col. 9, line 5. The force applied by electromagnetic actuator 182 to spool valve 180 *merely initiates* the spool valve's change of an hydraulically-generated force; and it is that *hydraulically-generated*

force that causes relative rotation to alter the phase-angle difference between driving and driven rotational members. This is fundamentally different from Applicant's claimed apparatus, which relies directly on an electromagnetic force to effect relative rotation and alter the phase-angle difference between driving and driven rotational members.

Each of Suga's other embodiments also utilizes hydraulic pressure to alter the phase-angle difference between driving and driven rotational members. Specifically, the embodiment of Figs. 9-12 relies on a linear electromagnetic actuator 280 to move a spool valve 278, which controls delivery of hydraulic pressure. The embodiment of Figs. 1-4 relies on an electromagnetic valve 66, which either supplies or cuts off hydraulic pressure to the mechanism.

In view of the foregoing, Suga does not anticipate any of the claims. Accordingly, the rejection should be withdrawn.

CONCLUSION

Applicant respectfully submits that the application is in condition for allowance. The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

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